

Controlling Gag Reflex with Low Power Laser Acupuncture for Tooth Restoration: A Case Report

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Submitted: 2018-06-21; **Accepted:** 2018-07-10; **DOI:** 10.22037/rrr.v3i3.23171

Introduction: Gag reflex is common during dental procedure such as, taking radiography, oral examination and alginate impression. This reflex has negative impact on the quality of any dental procedure. Acupuncture is traditional alternative medicine by inserting needle in special point in body. Because of cross-infection and other risks; studies have suggested the laser acupuncture that use low level laser (LLLT) or photobiomodulation instead of needle. Various anti-gagging points have been identified; include Neiguan Pericardium 6 (PC6), large intestine point or He Gu point (LI4), Conception Vessel 24 (CV24) and Shenmen, Stomach and Throat points on ears and P6 point is a one of the best point to control nausea and vomiting and is located at medial of the forearm below the palm. **Materials and Methods:** The purpose of this study was to report controlling gag reflex during routine dental procedure with stimulation P6 acupuncture point with low power laser. A patient who has severe gag reflex and for this reason this reason her oral hygiene level is awful, also clinical examination showed multiple caries. The gag reflex was controlled with stimulation P6 point on her wrist with 6 J/cm² energy density and 980 nm wavelengths. **Results:** Gag reflex was successfully controlled. **Conclusion:** LLLT acupuncture needs less time, low invasive and much safer than other methods. Because of point P6 location it seems this point is more suitable than other anti-gagging points. Dentist who tried LLLT acupuncture must be trained and also adequate equipment should be in their dental office.

Keywords: Acupuncture; Dentistry; Gag Reflex; Low Level Laser; Photobiomodulation

Introduction

The gag reflex is a natural physiological reaction and its main purpose is to prevent foreign material or harmful object from entering the oropharynx and upper gastrointestinal tract. It has been stated that the responsible stimuli for the gagging may vary from patient to patient. Gag reflex may result of stimulation of tissues of oropharynx (somatic reasons) or physiologic such as taste, smell and perception of specific material(1-3). Prevalence of gag reflex is about 8.2 percent and is most commonly experienced during dental procedures include taking radiography, restoration procedure in posterior teeth, primary intraoral examination, alginate impression and dentures. Certainly this reflex has negative impact on the quality of any dental procedure while controlling this reflex improves the quality of dental treatment(4-6). this reflex may causes nausea, vomiting and violent spasms of the oropharynx and abdomen muscles (7).

Various technique are used to ban or reduce the gag reflex include psychological and behavioral therapies like relaxation and distraction techniques; local and general anesthesia, conscious sedation, acupuncture and other modern methods include hypnosis and stimulation taste bud with salt (4, 7, 8).

Acupuncture was introduced by Chinese over than 3000 years ago (9) as an alternative medicine by inserting needles at different acupuncture points in the body(10). Due to fear of cross-infection or transcutaneous lesion, using a needle in an acupuncture is not recommended (11). That's why; studies have suggested the laser acupuncture. In this method a low level laser (LLLT) is used on acupuncture points instead of needle, although it follows the principles of traditional acupuncture (11, 12). This method has been used since from 1970s. Studies demonstrated that laser acupuncture can be effective in treatment of temporomandibular dysfunction, myofascial pain and gagging reflex (13). Different anti-gagging points have been



Figure 1. Applying 980 diode laser for controlling gag reflex

identified; include Neiguan Pericardium 6 (PC6), large intestine point or He Gu point (LI4), Conception Vessel 24 (CV24) and Shenmen, Stomach and Throat points on ears. Stimulating these points activate mechanisms that block the gag reflex path. PC6 is a one of the best determined acupuncture point to control nausea and vomiting and is located at medial of the forearm below the palm (14-17).

This study reports a patient needed multiple teeth restorations who suffered from severe gag reflex.

Report of case

A 29-year-old, generally healthy girl without systemic diseases complained of the multiple dental caries referred to private office. In oral examination, it was realized that she suffered from severe gag reflex and for this reason her oral hygiene level is awful, also clinical examination showed caries in #14, #15, #16, #25, #26, #27, #28, #37, #45 and #47 teeth with normal periodontal pocket depth. As the patient declined the traditional Acupuncture, for controlling gag reflex the LLLT acupuncture was used on P6 point on right hand of patient. The Diode LASER (Wiser, Doctor Smile, Italy) with power output 200 mW, at wavelength of 980 nm and energy of 6 J was used. A total of 4 courses of laser acupuncture (each course was 30 seconds) in 5 session was performed (Figure 1). Treatments performed in each session were following:

Session 1: Scaling and root planning, Class V composite filling tooth #16 #14 #15

Session 2: low power laser acupuncture with power 200 mw for 30 second on point P6, Class V composite filling tooth #37

Session 3: low power laser acupuncture with power 200 mw for 30 second on point P6, Class V composite filling teeth #25 #26

Session 4: low power laser acupuncture with power 200 mw for 30 second on point P6, Class V composite filling teeth #45 #47 and class III composite filling tooth #48

Session 5: low power laser acupuncture with power 200 mw for 30 second on point P6, Class III composite filling teeth #27 #28

The energy density was 6J/cm². The patient can tolerate the treatment without having nausea or vomiting.

Discussion

Most dentist treated patients how have severe gag reflex that made a lot of trouble in dental procedures, the reason of gag reflex either somatic or psychological. In somatic gagging, reflex onset from stimulation of the surrounding tissues of border of tongue and part of palate (1). Different studies demonstrate gag reflex occurs during taking radiograph or restoration of posterior teeth, primary intraoral examination and orthodontic patient. Controlling gag reflex with acupuncture and laser acupuncture have been suggested. Mechanism of acupuncture

Contains

1. Stimulation of afferent nerve causes various substances to secrete in spinal cord like enkephalin and dynorphin that block pain.
2. The cells in midbrain after stimulation send descending signals the dorsolateral tract that release norepinephrine and serotonin in the spinal cord. These neurotransmitters block pain and postsynaptically
3. Stimulation causing release of beta-endorphin into the blood which can result is the release of adrenocorticotrophic hormone (18).

Various studies demonstrated laser acupuncture is effective treatment for diseases that faced in dentistry. As well as this technique is safe, low invasive and need less time. Laser acupuncture is suitable for children, adult who fear of needle that used for acupuncture. Studies show that laser acupuncture and needle acupuncture have same efficacy in treatment and controlling gag (13, 19) Different studies show that three points have the most effect, P6 Neikuan, CV24. (14) Stimulation P6 have effect on controlling gag reflex and reduce nausea and vomiting, this point is located on wrist, between two tendons, 2.5cm from wrist crease and 0.5 to 1.0 cm deep

applying 980-nm diode laser at 3 to 4 J to this point for 1 minute is suggested. (17) One study illustrated that pressing P6 can be effective in controlling the gag reflex. (20) In 2014, Zotelli *et al.* (20) found that needling at acupuncture point P6 was effective for controlling gag reflex during alginate impression. Schlager *et al* and Butkovic *et al.* (21, 22) found laser acupuncture applied to P6 point after surgery may reduce postoperative nausea and vomiting in children. Elbay *et al* (1) in 2016 conducted a study on 33 children, also laser energy density in this study is 4 J/cm², and they demonstrated that stimulation P6 point with low-power laser has notable effect on controlling gag reflex during maxillary radiography. In 2017 Goel *et al.* (14) stimulated point P6 with LLLT for 20 patients who age is between 4 up to 14, they detected LLLT on P6 point was effect on reducing anxiety and gag reflex.

Another point that located on at the center of the mentolabial fold below the lip is conception vessel 24 (CV 24) (2). Rosted *et al.* (23) was detect that acupuncture CV-24 effective technique of controlling gag reflex during dental treatment. Sari *et al.* (19) found laser acupuncture on both points CV-24 and PC-6 have synergic effect on controlling gag reflex in orthodontic patients. Haghighat A *et al.* (24) evaluated effect of needle acupuncture on P6 point and anti-gagging acupuncture points on controlling gag reflex during routine dental procedure and they can't found significant different between P6 and another anti-gagging acupuncture points. Bilello and Fregapane in 2013 (3) used both P6 and CV-24 for acupuncturing, they indicted that gag reflex is relief after stimulation these point with needle.

Fiske and Dickinson (25) in 2001 tried Shenmen, stomach and throat points that located on ear. The result of this study show after stimulation these points, gag reflex was controlled in patients. Ebadi *et al.* (26) also used the same point for acupuncturing and indicted remarkable decrease in gag reflex during taking maxillary alginate impression.

Sometimes needles of traditional acupuncture may cause tissue injury such as hematoma, pain and vegetative symptoms or cross-infection (HIV or HBV) (2) as well as needle may cause fear and make patient anxious, for this result it's better to use LLLT Instead of needle (27). Laser acupuncture is easy method and In comparison with traditional acupuncture needs less chair time, noninvasive, painless and safer (11). Also it seems point P6 because of its location is more suitable than CV-24 and Shenmen, stomach and throat points.

Conclusion

LLLT acupuncture point P6 is effective method for controlling gag reflex during dental procedure, this technique needs less time, low invasive and much safer than other methods. Because of point P6 it seems this point is more suitable than other anti-gagging points. Dentist who tried LLLT acupuncture must be trained and also adequate equipment should be in their dental office. Future research about another effects of LLLT acupuncture should be done, possible side effects and duration of time that LLLT effects remain in the body are necessary.

Conflict of Interest: 'None declared'.

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Please cite this paper as: Sarabadani J, Labafchi A, Chiniforush N. Controlling Gag Reflex with Low Power Laser Acupuncture for Tooth Restoration: A Case Report. *Regen Reconstr Restor.* 2018;3(3): X-X. *Doi:* 10.22037/rrr.v3i3.23171.